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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,006	03/24/2005	Yasuo Nishi	KOY-0046	8797

23413 7590 04/17/2006

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EXAMINER
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BOECKMANN, JASON J

ART UNIT	PAPER NUMBER
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3752

DATE MAILED: 04/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/529,006	<b>Applicant(s)</b> NISHI ET AL.	
	<b>Examiner</b> Jason J. Boeckmann	<b>Art Unit</b> 3752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 4 and 5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6 and 8-14 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/24/2005</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

Claims 4, 5 and 7 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 3/15/2006.

Examiner notes that claim 7 pertains to the non-elected species III, due it including a heater. Therefore it is considered withdrawn along with claims 4 and 5. Acknowledgement in next office action required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 6 and 8-11, are rejected under 35 U.S.C. 102(e) as being anticipated by Hotomi (5,477,249).

Hotomi shows a liquid jetting apparatus comprising; a liquid jetting head (4) comprising a nozzle (15) to jet a droplet from an edge portion, an inside diameter (figure

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1) of the edge portion being 20 micrometers (column 3, line 61); a liquid solution supplying section (6) and a jetting voltage applying section (9, 17) to apply a voltage to the liquid solution and a convex meniscus forming section (10, 14) to form a state where the liquid solution in the nozzle protrudes from the nozzle edge portion (figure 1).

Regarding claims 2 and 3, Hotomi shows an operation control section (13, 11, 18) to control the driving voltage of the convex meniscus forming section (10, 14) and the jetting voltage by the jetting voltage applying section (9, 17). The operation control section comprises; a first jetting control section (11) to control the driving voltage of the convex meniscus forming section (10, 14) and the liquid jetting section (9, 17); and a liquid stabilization control section to draw a liquid level at the nozzle edge (10, 14, 2).

Regarding claim 6, the convex meniscus forming section comprises a piezo element (14) that changes the capacity of the nozzle. Regarding claim 8, the claimed equation is an obvious expression of a functioning electrostatic jetting nozzle. Regarding claims 9 and 10, the nozzle is formed from a material having an insulating property (column 6, line 41).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hotomi (5,477,249).

Hotomi shows all aspects of the applicant's invention as in claim 1, but does not specifically disclose that the inside diameter of the nozzle opening is not more than 4 micrometers. However, it is well known that the geometry and size of the meniscus is controlled by outlet size. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to make the inside diameter of the outlet of Hotomi's nozzle less than 4 micrometers in order to change the size and shape of the meniscus as well as the droplet.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Winston (3,060,429) shows a liquid sprayer that sprays electrically charges droplets. Kojima (3,886,565) shows a liquid injection nozzle. Yogi et al (6,811,090) shows a minute droplet forming apparatus that electrically charges the

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liquid being dispensed. Hotomi (6,036,302) shows a liquid jetting device with a piezo element and an induced electric field. Tsuzuki et al (4,281,333) shows an ink jet printer nozzle that has a piezo element to change the capacity of the nozzle.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason J. Boeckmann whose telephone number is (571) 272-2708. The examiner can normally be reached on 7:30 - 5:00 m-f, first Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David A. Scherbel can be reached on (571) 272-4919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JJB

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4/13/06

  
David A. Scherbel  
Supervisory Patent Examiner  
Group 3700